

REMARKS

Claims 1-8, as amended, and new claims 9 and 10 are before the Examiner for consideration.

1. The drawing objection is noted. A replacement drawing is enclosed with an additional new box for the cooling step requested by the Examiner. The box legend reads "Cooling from a maximum sintering temperature to 1300°C at a rate not larger than 100°C/hour." The phrase is based on the statements on page 4, second full paragraph, and page 8, last paragraph of the specification. The slow cooling concept is discussed in the full paragraph on page 6 of the specification. No new matter is added.

2. Claim 1 is amended to clarify that the maximum temperature is greater than 1300°C because the sintered honeycomb is to be cooled down to a temperature of 1300°C at the specified maximum rate of 100°C/hour. Such cooling down to 1300°C can only occur if the sintered honeycomb is sintered at a temperature greater than 1300°C. See the above-mentioned discussion of the slow cooling on page 6. New claim 9 is presented to define a preferred maximum temperature of 1425°C; see lines 2 and 3 of the

Serial No. 09/980,940

full paragraph on page 6. New claim 10 is presented to recite a temperature descending rate of less than 100°C/hr., the next step down from "not larger than 100°C/hour." See the embodiment of claim 7 where the temperature descending rate is less than 100°C/hour.

3. Claims 1, 3, 4, 5 and 8 are rejected under 35 U.S.C. 102(e) as anticipated by Merkel (6,391,813). This rejection is traversed.

Applicants' invention involves producing a cordierite ceramic honeycomb by adding forming agents into raw materials becoming cordierite; mixing these ingredients to form a raw material batch; extruding the batch to obtain a formed body; drying the formed body; sintering the formed body after drying at a maximum temperature that must be above 1300°C to form the cordierite; the final step is cooling from the maximum temperature down to 1300°C at a temperature descending rate that is not larger than 100°C/hour.

Applicants have found that by controlling the cooling, more particularly, the temperature descending rate, after the sintering step from a maximum temperature to 1300°C at a rate not larger than

Serial No. 09/980,940

100°C./hour, the cordierite crystal phase is increased, making it possible to form a cordierite ceramic honeycomb with a low thermal expansion coefficient. See the discussion at page 4, second full paragraph, of the specification.

Merkel '813, entitled "Low sintering temperature cordierite batch and cordierite ceramic produced therefrom," states in the "Field of the Invention" that the invention:

relates to cordierite forming batch mixtures that are capable of being sintered at greatly reduced sintering temperatures to form cordierite ceramics.

The "Summary of the Invention" at col. 2, lines 42 to 45, contains the statement that:

it has been found that the addition of a metal oxide to a cordierite-forming raw material batch mixture can be utilized to produce cordierite bodies at sintering temperatures of no greater than about 1300°C.

Serial No. 09/980,940

Merkel '813 thus is directed to a low temperature sintering process and does not teach or suggest the present invention where the cordierite-forming materials will be sintered at a maximum temperature that is greater than 1300°C. The Examiner refers to a reference cooling rate of 100°C/hr. (col. 6, line 59), but that rate is for cooling below 1300°C. and does not teach or suggest the critical process step of the instant invention where cooling takes place between the maximum sintering temperature (clearly higher than 1300°C) and the lower temperature of 1300°C.

The Examiner also cites coefficients of thermal expansion appearing in col. 15, line 30. Applicants again point out that Merkel '813 is not sintering at maximum temperatures greater than 1300°C.

Accordingly, review and withdrawal of this rejection are requested.

Serial No. 09/980,940

4. Claims 2, 6, and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants appreciate this indication of allowable subject matter but respectfully submit for the reasons given above in claim 1 is also allowable and thus these dependent claims are allowable as they presently read.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Serial No. 09/980,940

Should the Examiner deem that any further action by the applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to telephone the undersigned at the number listed below.

September 17, 2003
Date

Respectfully submitted,

PARKHURST & WENDEL, L.L.P.



Charles A. Wendel

Registration No. 24,453

CAW/EC/ch

Enclosures:

Figure 1 Annotated

Figure 1 Replacement

Attorney Docket No. NSUG:848

PARKHURST & WENDEL, L.L.P.
1421 Prince Street, Suite 210
Alexandria, VA 22314-2805
Telephone: (703) 739-0220



FIG. 1

